CLAIMS:

1. A method of removing sodium from an animal subject comprising administering to an animal subject in need thereof an effective amount of a sodium-binding composition comprising a sodium-binding polymer, said polymer having an *in vivo* sodium binding capacity of 4 mmol or more per gram of said polymer in a human.

2. The method of claim 1 wherein said sodium-binding composition retains a bound sodium in a lower gastrointestinal tract.

3. The method of claim 2 wherein said sodium-binding composition exhibits decreased permeability to said bound sodium in said lower gastrointestinal tract.

4. The method of claim 1 wherein said sodium-binding composition retains a significant amount of a bound sodium in an environment comprising of 1:4 ratio of Na^+:K^+ concentration.

5. The method of claim 1 wherein said sodium-binding composition swells in an isotonic fluid environment.

6. The method of claim 2 wherein said sodium binding and/or sodium retention by said sodium-binding composition is dependent on a pH of an environment surrounding said polymeric composition.

7. The method of claim 2 wherein said sodium binding and/or sodium retention by said sodium-binding composition is dependent on a concentration of bile acids and/or fatty acids in an environment surrounding said polymeric composition.

8. The method of claim 2 wherein said sodium binding and/or sodium retention by said sodium-binding composition is dependent on an activity of enteric enzymes in an environment surrounding said polymeric composition.

9. The method of claim 1 wherein said sodium-binding composition comprises sulfonate or phosphonic polymers.

10. The method of claim 1 wherein said sodium-binding composition does not release detrimental ions.

11. The method of claim 10 wherein said detrimental ion is at least one of K^+, Cl^-, OH^-, or Ca^{2+}.

12. A method of removing sodium from an animal subject comprising administering to an animal subject in need thereof an effective amount of a sodium-binding

composition comprising an acid resin, said resin having an *in vivo* sodium binding capacity of 4 mmol or more per gram of said resin in a human and said composition retains a bound sodium in a lower gastrointestinal tract.

13. The method of claim 12 wherein said acid resin comprises repeat units charged with H^+ or NH_4^+ ions.

14. The method of claim 1 or 12 wherein said effective amount of sodium-binding composition administered is not greater than about 15 gms per day.

15. The method of claims 1 or 12 wherein said sodium-binding composition removes about 50 mmol of sodium per day.

16. The method of claim 1 or 12 wherein said sodium-binding composition comprises at least one of polyvinylsulfonate polymer, polyvinylsulfamate polymer, polyvinylsulfamate/vinylsulfate copolymer, polyvinylphosphoramidic polymer, N-(bis-phosphonic-ethyl) polyvinylamine polymer, poly-α-fluoroacrylic acid polymer, vinylphosphonate/acrylic acid copolymer, vinylphosphonate/α-fluoroacrylic acid copolymer, polyvinylsulfate polymer, crosslinked polyvinylsulfamate polymer, or poly α-acrylic acid polymer.

17. A method of removing sodium from an animal subject comprising administering to an animal subject in need thereof an effective amount of a core-shell composition comprising a cation exchange core and a semi-permeable shell, said cation exchange core being capable of binding sodium in an upper gastro-intestinal tract and the semi-permeable shell being characterized by decreased permeability to the bound sodium in a lower gastro-intestinal tract.

18. The method of claim 17 wherein the core has an *in vivo* sodium binding capacity of 4 mmol or more per gram of said resin in a human.

19. The method of claim 17 wherein said core binds more sodium in said upper gastrointestinal tract in the presence of said shell component compared to amount of sodium bound by said core in the absence of said shell component.

20. The method of claim 17 wherein said semi-permeable shell preferentially binds chloride.

21. The method of claim 17 wherein said semi-permeable shell prevents entry of competing solutes.

22. The method of claim 17 wherein said competing solute is at least one of K^+, Mg^{++}, Ca^{++}, NH^{4+}, H^+, or protonated amines.

23. The method of claim 21 wherein said semi-permeable shell is permeable to sodium ions at a pH of about 1 to about 5.

24. The method of claim 17 wherein said core preferentially binds sodium in said upper gastro-intestinal tract and said semi-permeable shell is permeable to sodium ions at a pH of about 7 and above and said permeability to ions is decreased at a pH of about 5 to about 6.

25. The method of claim 17 wherein said permeability of said semi-permeable shell is modulated by a binding of bile acids and/or fatty acids to said shell.

26. The method of claim 17 where in said permeability of said semi-permeable shell is modulated by enteric enzymes or enzymes produced by colonic microflora.

27. The method of claim 17 wherein said core comprises at least one of a polyvinylsulfonate polymer, a polyvinylsulfamate polymer, a polyvinylsulfamate/vinylsulfate copolymer, a polyvinylphosphoramidic polymer, a N-(bis-phosphonic-ethyl) polyvinylamine polymer, a poly-α-fluoroacrylic acid polymer, a vinylphosphonate/acrylic acid copolymer, a vinylphosphonate/α-fluoroacrylic acid copolymer, a polyvinylsulfate polymer, a crosslinked polyvinylsulfamate polymer, or a poly α-acrylic acid polymer and said shell comprises of at least one of a poly-11 trimethylammonioundecylmethacrylate polymer, a styrene-vinylpyridine polymer, 11-dimethyl-aminodecylmethacrylate/laurylmethacrylate copolymer, or a polyallylamine/polystyrene sulfonate polymer.

28. A method of removing salt from an animal subject comprising administering to an animal subject in need thereof an effective amount of a salt-binding composition comprising a salt-binding polymer, said salt-binding polymer binding chloride and sodium and said composition retains bound sodium in a lower gastrointestinal tract.

29. The method of claim 28 wherein said polymer has an *in vivo* sodium binding capacity of 4 mmol or more per gram of said polymer in a human.

30. The method of claim 28 wherein said salt-binding composition is an internal salt of a polyelectrolyte complex, said complex being prepared from polymers of opposite charges.

31. The method of claim 28 wherein said salt-binding composition does not introduce detrimental ions.

32. The method of claim 31 wherein said detrimental ions is at least one of K^+, Cl^-, OH^-, or Ca^{2+}.

33. The method of claim 28 wherein said dose of the polymeric composition is not more than 10 gms per day.

34. The method of claim 33 wherein said dose of the polymeric composition removes about 3 gms or more of salt per day.

35. The method of claim 1, 12, 17, or 28 wherein said animal subject is suffering from hypertension, chronic heart failure, end stage renal disease, liver cirrhosis, chronic renal insufficiency, fluid overload, or sodium overload.

36. The method of claim 35 wherein extra cellular water is removed from said animal subject.

37. The method of claim 35 wherein a beneficial effect is observed on fluid management, blood pressure control, and/or interdialytic weight gain.

38. The method of claim 1, 12, 17, or 28 wherein said animal subject is suffering from a disease characterized by a presence of abnormal quantities of sodium and/or water in the body of said animal subject.

39. The method of claim 1, 12, 17, or 28 wherein said animal subject is resistant to diuretic treatment and is suffering from hypertension, chronic heart failure, end stage renal disease, liver cirrhosis, chronic renal insufficiency, fluid overload, or a combination thereof.

40. The method of claim 1, 12, 17, or 28 wherein a small amount of sodium is removed from the animal subject over an extended period of time.

41. The method of claim 1, 12, 17, or 28 wherein treatment of said animal subject prevents formation of edema after a cardiac event.

42. The method of claim 1, 12, 17, or 28 wherein said animal subject is suffering from volume/salt sensitive diastolic heart failure.

43. The method of claim 1, 12, 17, or 28 wherein said composition is co-administered with a diuretic, an ACE inhibitor, an α- blocker, a β- blocker, an angiotensin II receptor blocker, or a combination thereof.

44. The method of claim 1, 12, 17, or 28 wherein said composition is co-administered with a laxative.